AMSAT News Service Weekly Bulletins
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SB ALL @ AMSAT $ANS-125.01
AMSAT'S GREAT SHOWING AT DAYTON

HR AMSAT NEWS SERVICE BULLETIN 125.01 FROM AMSAT HQ
SILVER SPRING, MD MAY 5, 1990
TO ALL RADIO AMATEURS BT

Radio Amateurs Show Great Enthusiasm For MICROSATs At Dayton Hamvention '90

At this year's Dayton Hamvention, many thousands of radio amateurs were exposed to the radio amateur satellite service and AMSAT. During the world famous event in which over 35,000 hams participated, over $21,000 was donated to AMSAT. This is taken as a significant expression of support for the MICROSATs and AMSAT's SAREX-II activities. In addition, over 190 hams either became new AMSAT members or renewed their existing membership.

Throughout the weekend, there was always a major traffic jam in front of the AMSAT booth as the friendly AMSAT volunteers worked to answer questions and provide information. All of the volunteers (AA0P, WD0HHU, VK5AGR, N4HY, W5IU, KO5I, W1XT, W3IWI, WA4GSS, K8QKY, K8MU, WA3GOV, WB2IBO, N2QQ, KA8JBA, Martha Sargarovitz, and Barbara Myers) put in long hours to help make this the best Dayton ever for AMSAT.

AMSAT sponsored two forums. AMSAT-NA General Manager and President Doug Loughmiller (KO5I) started things off with a discussion titled: "1990: Year of the Amateur Radio Satellite." At this very well attended forum, Doug presented WD0HHU with a gold watch given to him for his efforts in Kourou, French Guiana during the MICROSAT launch campaign. Doug also talked about where AMSAT has been and what its goals are for the upcoming years.

After Doug, Tom Clark (W3IWI) discussed the Shuttle Amateur Radio Experiment (SAREX) currently planned for mid May. Bill Tynan (W3XO), AMSAT-NA's VP for Manned Operations and news correspondent Roy Neal (N6DUE) further elaborated on the SAREX mission and what it means for hams and school age youngsters all over the world.

Finally, Bob McGwier (N4HY) gave a complete run-down on the MICROSATs. Bob stated that he and Harold Price (NK6K) plan to have all the MICROSAT mailbox BBS software working by Field Day '90. Also, the next time you hear DOVE-OSCAR-17 (DO-17) on two meters, it will not only be sending packets but also voice transmissions.

During the Saturday evening banquet, N4HY was honored for his many technical contributions to amateur radio by having the "Technical Excellence Award" bestowed upon him by the Dayton Amateur Radio Association.

AMSAT-NA VP for Field Operations, Jack Crabtree (AA0P), coordinator of this year's AMSAT Dayton Hamvention volunteers, wants to thank all those who came by the booth at Dayton. Next year Jack hopes to have an even bigger AMSAT showing at the Hamvention, including an AMSAT dinner banquet.

/EX
SB ALL @ AMSAT $ANS-125.02
WEBERWARE 1.0 NOW AVAILABLE

HR AMSAT NEWS SERVICE BULLETIN 125.02 FROM AMSAT HQ
SILVER SPRING, MD MAY 5, 1990
TO ALL RADIO AMATEURS BT

Weberware 1.0 Imaging Software Now Available To Process WO-18 Pictures

Beta testing of Weberware 1.0 (WW 1.0) is complete their testing and it is now released for general distribution. This unique package made its debut at the Dayton Hamvention last week. Many a radio satellite enthusiast was thrilled as an actual picture captured from WEBERSAT-OSCAR-18 (WO-18) was processed on an IBM PC as they watched. Chris Williams (WA3PSD) of Weber State University (WSU) said that although the early pictures from WO-18 were perhaps not all that interesting, now that the ground controllers at WSU have a better understand of this MICROSAT's attitude motion, they have modified the on-board software so that more pictures of the earth are now being snapped. In addition, the software now maintains better control the CCD camera iris settings and settling time. Through more operational experience, many more exciting pictures of the earth are expected soon.

Weberware 1.0 is designed to work on IBM PC clones which support EGA or VGA graphics. WO-18 is constantly sending picture data and the imaging data can be easily collected with a PSK modem. For further information about Weberware 1.0, contact the AMSAT-NA software exchange at (301) 589-6062.

/EX
SB ALL @ AMSAT $ANS-125.03
UOSAT-OSCAR-14 STATUS

HR AMSAT NEWS SERVICE BULLETIN 125.03 FROM AMSAT HQ
SILVER SPRING, MD MAY 5, 1990
TO ALL RADIO AMATEURS BT

New Software Being Uploaded Into UO-14

The past several weeks have seen 9600 baud packet activity begin through UO-14's Packet Communication Experiment (PCE). This week a much more sophisticated multi-tasking operating system, known as qcF, was installed in several stages. The first stage involved the multi-tasking kernal and the Prototype Housekeeping Task (PHT). The PHT greatly facilitates the loading of software into the RAM memory of UO-14. This new software also allows ground stations to digipeat through the PCE. Many stations have been using this digipeating capacity of UO-14 to test their 9600 baud modems. Also added to the PHT software is the telemetry support for the Cosmic Particle Experiment (CPE). The CPE continuously monitors cosmic particle activity and the obser-vations are reported in 53 bytes of data in the telemetry every five minutes.

To complete the final software load to UO-14 so that its mailbox BBS will be in operation, a great deal more work needs to be done. The software which performs the BBS functions include a file server system, the AX.25 packet handling algorithms, and more telemetry development to handle the Whole Orbit Data (WOD) tasks. A major programming milestone was reached on April 27 when a partial load of the final flight software was loaded into UO-14. Software engineers NK6K, G0/K8KA, and WB6YMH are working very diligently on both sides of the Atlantic to get the message store-and-forward software completed soon.

[ANS would like to thank G0/K8KA for providing the information for this bulletin.]

/EX
SB ALL @ AMSAT $ANS-125.04
SAREX-II INFORMATION, PART I

HR AMSAT NEWS SERVICE BULLETIN 125.04 FROM AMSAT HQ
SILVER SPRING, MD MAY 5, 1990
TO ALL RADIO AMATEURS BT

Shuttle Amateur Radio Experiment (SAREX) Set To Fly On May 16, 1990

STS-35 is now scheduled to lift-off on May 16, 1990. It will be carrying not only the ASTRO-1 experiment but also SAREX-II. The following is a discussion of the goals of SAREX-II by NASA and the ARRL.

SAREX-II is a secondary payload on STS-35, currently scheduled for launch on May 16, 1990. It will be located in the Aft Flight Deck of the Space Shuttle Columbia. Ron Parise, WA4SIR, the Payload Specialist and astronomer on Columbia will be the Astronaut ham operator.

SAREX-II-02 is a secondary payload on STS-37, currently scheduled for launch on November 1, 1990. It will be located in the Aft Flight Deck of the Space Shuttle Atlantis. Ken Cameron, KB5AWP, the pilot of Atlantis will be the Astronaut ham operator.

The American Radio Relay League (ARRL) is the customer on the SAREX-II payloads. NASA gave its authorization for SAREX operations for the following reasons:

> To encourage our youth to become excited about science and technology, and
>
> To familiarize large numbers of the general public with manned space flight

NASA's intent in making astronauts available for SAREX operations is to involve the largest possible number of people, particularly youngsters, in Amateur Radio and the US space program. With amateur radio clubs and hams, our astronauts will speak over amateur frequencies directly with large groups of students, showing teachers, parents and communities how Amateur Radio energizes youngsters about science, technology, and learning.

You can easily become a part of this activity in your local school, as the astronauts will operate the SAREX equipment in the amateur two meter band. You will be able to send and receive messages via packet for periods of about 12 hours daily. The astronauts' work schedules will determine your chances for a voice or television message, but Ron and Ken may have an hour or more each day for these modes.

The Johnson Space Center's Amateur Radio Club station, W5RRR, in Houston, Texas, will re-transmit astronaut's signals to WA3NAN, at Goddard Space Flight Center, in Greenbelt, MD (near Washington, DC), and to W6VIO, at the Jet Propulsion Laboratory in Pasadena, CA. These stations, plus W1AW and several VHF and UHF repeater groups, will re-transmit the signals on most amateur bands so that you and the students can copy the communications. You will hear NASA Mission Commentary, frequent bulletins to advise listeners of astronaut planned transmissions, and all amateur two-way voice and amateur television transmissions with the shuttles. Using a simple hand-held transceiver, you can open the world of science to hundreds of youngsters. Students themselves can take part in the shuttle flight via a packet connection, and some will even be able to talk directly to the astronauts in orbit.

ARRL and AMSAT are co-sponsoring these exciting missions, with AMSAT heading up technical operations. Hundreds of Amateur Radio operators have already been working behind the scenes for months. The ARRL takes the lead with information and educational support. ARRL Educational Activities Branch (EAB) and NASA HQ will create lesson plans for teachers. All you need to provide is a 2-meter rig or a packet radio setup. If you are a teacher or instructor, contact ARRL EAB to get everything you will need and regular news updates. If you are a parent or a grandparent, contact ARRL EAB and a local school. EAB will send you materials, including ways to convince teachers and school administrators that Amateur Radio is an important discipline the school

should take advantage of on a full-time basis.

This a tremendous opportunity for you to showcase SAREX 1990 and amateur radio to kids of all ages in a big way. Plan on being a part of it; contact ARRL EAB now and give your best to our exciting hobby and to our hope for tomorrow: America's youth.

Listen to the ARRL Bulletins on W1AW (see QST for CW and voice bulletins) on a daily basis; and to the AMSAT Nets on Tuesdays (U. S.), 3.840 MHz, 01:30Z to 03:00Z, and on Sundays (international), 14.282 MHz, 18:00Z to 21:00Z, +/- QRM.

[ANS would like to thank ARRL and NASA for this contribution. Stay tuned next week to the ANS bulletins for more details about the STS-35 mission and its amateur radio operations.]

/EX
SB ALL @ AMSAT $ANS-125.05
OPERATIONS NET SCHEDULE, REVISED

HR AMSAT NEWS SERVICE BULLETIN 125.05 FROM AMSAT HQ
SILVER SPRING, MD MAY 5, 1990
TO ALL RADIO AMATEURS BT

AMSAT-NA Operations Net Schedule Announced

AMSAT Operations Nets are planned for the following times. Mode B nets are conducted on an AO-13 downlink frequency of 145.950. Mode J/L nets are conducted on an AO-13 downlink frequency of 435.970.

Note that the times of these nets have been advanced slightly from the schedule released last week. Please discard the old schedule and refer to this one when planning to participate in the AMSAT-NA Operations Net.

Date UTC	Time	Phs	Mode	NCS	U.S. Day
13 May 90	0230	104	J/L	N5BF	Saturday
24 May 90	0145	104	J/L	TBD	Wednesday
04 Jun 90	0100	104	J/L	TBD	Sunday
15 Jun 90	0115	104	J/L	N5BF	Thursday
26 Jun 90	0115	144	B	N5BF	Monday

For information on the amateur satellite program and how you can participate, contact AMSAT-NA at P.O. Box 27, Washington, DC 20044, or phone (301) 589-6062, or contact your local AMSAT Area Coordinator.

/EX
SB ALL @ AMSAT $ANS-125.06
PHASE III-D DESIGN MEETING

HR AMSAT NEWS SERVICE BULLETIN 125.06 FROM AMSAT HQ
SILVER SPRING, MD MAY 5, 1990
TO ALL RADIO AMATEURS BT

Preliminary Design Review for New Satellite Held in Germany

Amateurs from around the world who are involved in the Radio Amateur Satellite Service are meeting in Marburg, West Germany from May 7 through May 9 to begin work on another major amateur satellite project. The purpose of the meeting is to set specific design goals for Phase III-D. The three days of meetings will cover a wide range of topics. Areas to be discussed will include: launch opportunities, orbit choices and constraints, transponder choices, antenna

design, on-board computer systems, and propulsion systems. In addition to setting hardware and software design goals, equally important discussions will focus on labor division between groups, monetary commitment required, and development of a communication structure between groups involved in the program.

AMSAT-NA will be represented at the meeting by Jan King, W3GEY, VP-Engineering, Bob McGwier, N4HY, Dick Jannson, WD4FAB, and Dick Daniels, W4PUJ. (It appears that these guys just can't seem to grasp the concept of "taking a break"). Once formal design goals have been determined, they will made available through the AMSAT News Service.

/EX
SB ALL @ AMSAT $ANS-125.07
FO-20 SCHEDULE ANNOUNCED

HR AMSAT NEWS SERVICE BULLETIN 125.07 FROM AMSAT HQ
SILVER SPRING, MD MAY 5, 1990
TO ALL RADIO AMATEURS BT

FO-20 to Remain in JA Mode Temporarily

JAMSAT has announced that while software improvements to the Store and Forward Digital BBS on FO-20 are being implemented, the satellite will remain in Mode-JA. The week of April 29 through May 6 is a Holiday in Japan, and it is expected that the software improvements will be finalized and tested during that week.

/EX
SB ALL @ AMSAT $ANS-125.08
NEW AO-13 TRANSPONDER SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 125.08 FROM AMSAT HQ
SILVER SPRING, MD MAY 5, 1990
TO ALL RADIO AMATEURS BT

New Transponder Schedule in Effect After Magnetorquing

Command Stations have been magnetorquing AO-13 during the perigees of orbits this past week. This procedure is essentialy complete and has re-aligned AO-13 for better pointing (squint) angles. A new transponder schedule has been announced by the AO-13 Command Station Team:

AO-13 Transponder Schedule from 05 May 90

```
Mode-B  : MA 000 to MA 100
Mode-JL : MA 100 to MA 125
Mode-LS : MA 125 to MA 130
Mode-S  : MA 130 to MA 135
Mode-BS : MA 135 to MA 140
Mode-B  : MA 140 to MA 256
Omnis   : MA 220 to MA 040
```

The best estimate of the current attitude is:

BLON = 180 and BLAT = +3 for 05 May 90

More exact values will be announced soon. Only the Mode-S transponder and the Mode-B beacon will be ON from MA 135 to MA 140.

AO-10 is currently experiencing poor solar panel illumination angles and until further notice its transponder is not available for use.

/EX

Posted: Sun, May 6, 1990 6:13 AM GMT Msg: MGJA-4251-7561
From: TCLARK
To: is
Subj: SAREX News Bulletins

SB SAREX @ AMSAT < W3IWI $SAREX.001
SAREX Bulletin #1: Concerning logs

SAREX INFORMATION BULLETIN SAREX.001
de W3IWI 5/6/90

The WA4SIR flight aboard the STS-35 flight of the Shuttle Columbia is still officially scheduled for early May 16th (GMT), although there are some hints that it might slip by one day. The SAREX mission will carry the packet ROBOT automatic QSO machine which will allow many amateurs around the world to have two-way packet QSO's with the Shuttle during the times when our ham astronaut, Ron Parise is busy.

To work the ROBOT, you transmit on 144.950 MHz and listen to the Shuttle on 145.550 MHz. Subsequent SAREX information bulletins will give you operating hints and describe the schedule in more detail.

If you are successful in making a two-way QSO, you call and your unique QSO serial number will be automatically logged and you will receive a QSL card after the mission. You will know you met all requirements of a two-way QSO by seeing your call in the QSL beacon which will be sent every 2 minutes and looks something like:

```
WA4SIR>QSL <UI>:
NI3F/186 WB2TNL/185 W3IUI/179 WB3AFL/177 NF3N/176 WA3EPT/175
N4QQ/174 W3IWI/172 JY1/153 U6MIR/127
```

If you are heard by the ROBOT, your call will appear in the QRZ beacon which will look something like:

```
WA4SIR>QRZ <UI>:
#3405-NE3H NI3F K1LNJ WB2TNL WB3ILO N3ACL N3FWX WA3TSD WA3USG
etcetera
```

where the #3405 is a serial number incremented every 2 minutes when the QRZ beacon is sent.

Unlike the QSL "worked" list, the QRZ "heard" list is not retained in the ROBOT and the laptop computer on the shuttle. In order to send SWL cards to those who were heard, it will be necessary to have amateurs around the world help to collect the list. When you are monitoring the WA4SIR SAREX transmissions, try to capture the beacons and send them in to us in machine readable format. We are only interested in the QRZ and QSL beacon information; please strip out everything else (like QSOs monitored, any other beacons, etc.). You may send it through the amateur packet network addressed like this:

```
SP SAREX @ W3IWI.MD.USA
```

or via the Internet addressed like:

```
sarex@tomcat.gsfc.nasa.gov
```

and make the Subject: field contain the date/time of the beacons like:

May 19 @ 03:42z

/EX
SB SAREX @ AMSAT < W3IWI $SAREX.002A
SAREX Bulletin #2: Hints and Suggestions

SAREX INFORMATION BULLETIN SAREX.002
de W3IWI 5/6/90

Here are several hints that may help you make a successful packet QSO with the SAREX ROBOT that will fly with Ron Parise, WA4SIR in mid-May.

1. Frequencies: Your transmitter uplink frequency should be 144.950 MHz and you should listen for the shuttle downlink 600 kHz higher on 145.550 MHz. Under no conditions should you transmit on the 145.550 downlink!

Since there may be other packet or voice activity in your area on these frequencies, local coordination to insure a clear frequency during the ten day STS-35 mission may be needed.

2. Modulation: The uplinks and downlinks are ordinary AFSK/FM 1200 BPS signals, just like most terrestrial VHF packets. No special modems are needed. You are advised to check your transmitter's FM deviation and set it to 3 kHz or less. Most radios are typically set to 5-6 kHz and this will be too wide because of doppler shifts. If you don't have a deviation meter, listen on another radio and crank the tone level down until you hear the volume drop noticeably. Most people run too much deviation on their packet signals anyway, and you will probably find this improves the reliability on terrestrial paths too!

3. When to hear/work the shuttle: During the mission Keplerian elements and predictions will be sent frequently by WA3NAN, W5RRR, W6VIO, and many local FM repeaters, as well as by packet bulletins addressed to @AMSAT. Check with your local AMSAT area coordinators for information in your area. In general in the USA, the windows are in the late evening and early morning hours. Don't expect the SAREX hardware to be activated until the second day of the ten-day mission. Because the inclination of the shuttle orbit is only 28.5 degrees, the signals can only be heard between about +43 and -43 degrees latitude.

[continued in part 2]

/EX
SB SAREX @ AMSAT < W3IWI $SAREX.002B
SAREX Bulletin #2: Hints cont'd

SAREX INFORMATION BULLETIN SAREX.002 continued
de W3IWI 5/6/90

4. LISTEN!!!: Most packeteers don't listen to the BRAAAAP! from their radios, but you should listen during the shuttle activity. If Ron is personally available, he may turn off the SAREX packet hardware and be QRV on voice.

5. Connecting to the shuttle: All you do is to issue a connect. If you are heard, you will see something like this:

```
   cmd: CONNECT WA4SIR
   *** Connected to WA4SIR
   #191--- Tnx QSO with the SAREX Shuttle "ROBOT" automatic QSO machine
   *** DISCONNECTED
```

When the ROBOT hears your "ack" of its transmission, it will disconnect

and you will be in the log. Because the ROBOT queues information for 3 seconds and sends several replies in one transmission, you should set your DWAIT to about 4 seconds.

6. Multiple QSO's: Once you have worked the ROBOT and make it into the log, no further QSO's from you will be logged (even if you use a different SSID). Give others a chance and don't connect multiple times!

7. Monitor!!!: Every 2 minutes a beacon addressed to QRZ will list stations heard recently, and the QSL beacon will list those worked. Every 3 minutes the Metabeacon (up to 1.7 kbytes in 7 packet frames) addressed to QST will send text describing shuttle activities. Monitor these beacons to keep informed. In Bulletin #1 we ask for you to submit copies of the QRZ and QSL beacons you copy.

8: Your chances for success: Signals from many hundreds of stations can be heard from the shuttle. With FM transmissions, only the strongest signal "wins", just like in a DX pileup. To help, the ROBOT can have up to 9 QSO's in progress at any one time. Perserverance and a well equipped station will help -- but if activity levels are high and the uplink channels are busy, it will be a matter of luck.

/EX

SB SAREX @ AMSAT < W3IWI $SAREX.003
SAREX Bulletin #3: ASTRO-1

SAREX INFORMATION BULLETIN SAREX.003
de W3IWI 5/6/90

Despite all the SAREX activity, our STS-35 ham astronaut Dr. Ron Parise, WA4SIR, is NOT officially going into orbit for the ultimate DXpedition! The reason for the STS-35 mission is to fly ASTRO-1.

With the recent successful STS-31 mission deploying the Hubble Space Telescope (HST) was the first step of an astronomical "double-header". It will be followed in mid-May by the ASTRO-1 mission which will carry a number of specialized telescopes on its 10 day mission. Ron is one of the STS-35's crew of seven which also includes

  Vance Brand, Mission Commander
  Col. Guy Gardner, Pilot
  Dr. Bob Parker and Mike Lounge, Mission Specialists
  Drs. Jeff Hoffman, Sam Durrance and Ron Parise, Payload Specialists

The ASTRO-1 Observatory in the STS-35 payload bay consists of four instruments. The first three are mounted on a single pointing systems and fly above the earth's atmosphere to observe in the ultraviolet spectral regions:

1. HUT: The Hopkins Ultraviolet Telescope from Johns Hopkins Univ. is a spectroscopic instrument for observing faint objects like quasars, active galactic nuclei and normal galaxies in the far UV.

2. UIT: The NASA/Goddard Ultraviolet Imaging Telescopy is designed to obtain images (pictures) of hot stars and galaxies with a wide field of view.

3. WUPPE: The Wisconsin Ultraviolet Photo-Polarimeter Experiment is intended to observe the polarization of UV light from quasars, hot stars and galaxies.

This cluster of three UV instruments work together and should make 200-300 observations during the mission.

The fourth instrument is an X-ray experiment with its own independent pointing system:

4. BBXRT: The Broad-Band X-Ray Telescope views high-energy objects like active galaxies and quasars. While BBXRT can be operated independently of the 3 UV instruments, it can be slaved to the UV telescopes for coordinated observations. It is also expected to make 200-300 observations during the mission.

The ASTRO-1 mission is but the first of a series. These and similar instruments will be reflown on later missions. ASTRO requires an orbit with maximum time at night, and minimum exposure to charged particles in the South Atlantic Anomaly -- these requirements dictate a nighttime launch from Cape Kennedy.

/EX

Posted: Thu, May 10, 1990 3:47 AM GMT Msg: CGJA-4255-7711
From: TCLARK
To: is
Subj: SAREX.004: Launch Delay

SB SAREX @ AMSAT < W3IWI $SAREX.004
WA4SIR SAREX/STS-35 LAUNCH DELAYED

SAREX Bulletin SAREX.004
de W3IWI 5/9/90

The flight of WA4SIR with the SAREX hardware aboard the Shuttle Columbia is delayed at least 2 weeks, meaning the flight will be in June at the earliest. The problem is contamination in a valve in one of the two redundant freon cooling systems. All the tubing associated with the valve is sweated together and there is a lot of concern about using torches in the orbiter to fix it on the launch pad. Normally a repair like this would be done in Orbiter Processor Facility, but this would mean a rollback of the Columbia and a long delay which would in turn force a re-scheduling of the mission. Since the valve replacement is not a usual activity, it is not possible to predict the delay. Stay tuned for more information.

The following is excerpted from a 5/9 NASA press release:

NASA managers today decided to replace an apparently faulty valve in the orbiter Columbia's freon coolant loop. The work, will likely delay the launch of STS-35 by 2 to 3 weeks. A better estimate of the time required to perform the work will be available early next week. Shuttle managers assessed the relative risks associated with performing the work at the launch pad, versus in the Orbiter Processing Facility, and decided that completing the replacement and checkout on the pad is as safe and effective.

"We are obviously disappointed that we are not ready to fly," said Space Flight Associate Administrator Dr. William B. Lenoir. "However, this particular system is absolutely critical to the safety of the crew and overall mission success, so we have decided to change the component."
/EX